Unit-2 Mastery Assessment (version 650)

Question 1 (10 points)

Let f represent a function. If $f[30] = 42$, then there exists a knowable solution to the equation below.

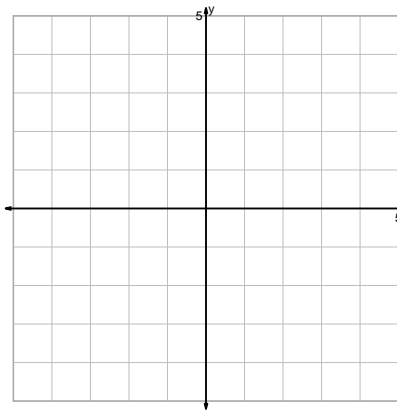$$y = \frac{f\left[\frac{x}{3} + 19\right]}{7} + 2$$
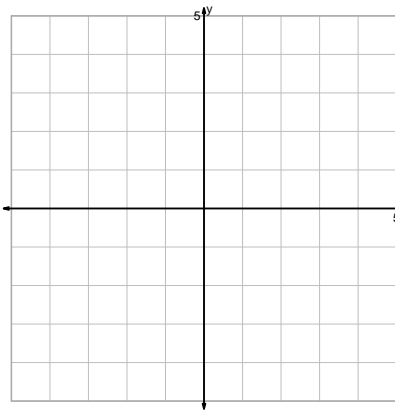
Find the solution.

$x =$

$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.
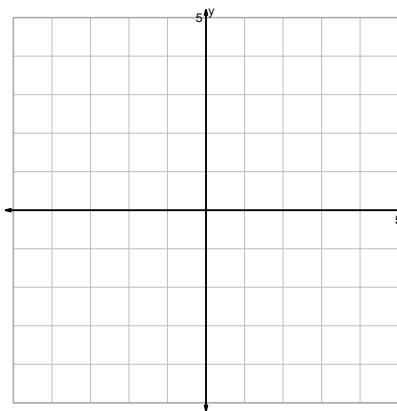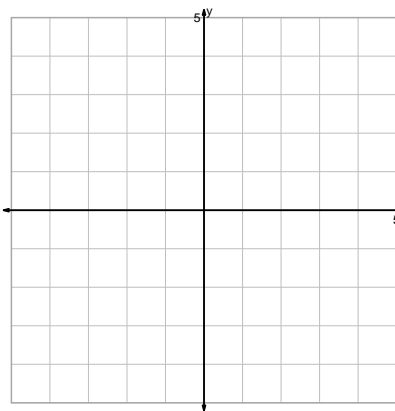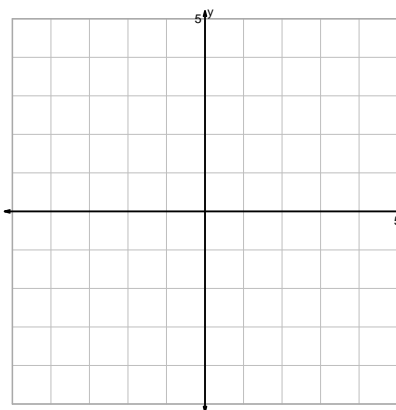
$y = \sqrt[3]{2x}$
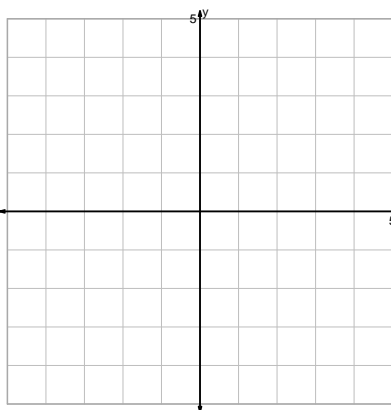
$y = x^2 + 2$
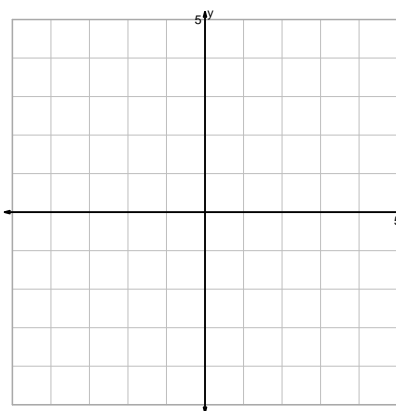
$y = \sqrt{x - 2}$

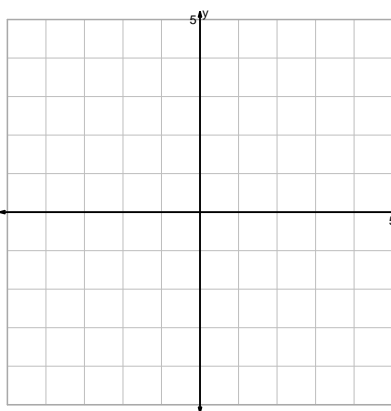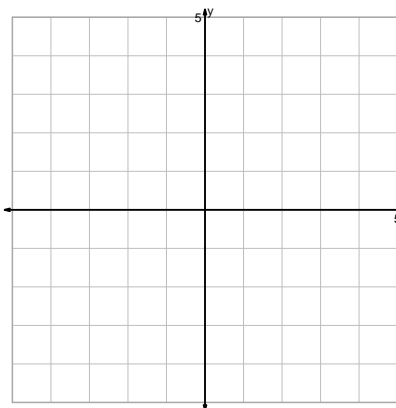$y = 2^{-x}$

$y = 2 \cdot x^3$
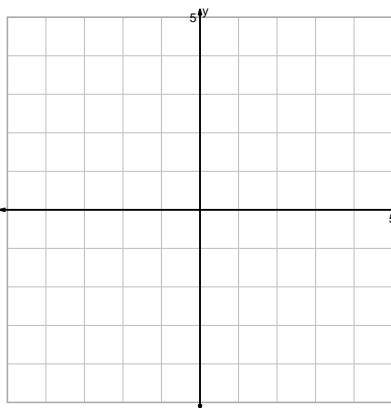
$y = -\sqrt{x}$

$y = x^3 - 2$

$y = \log_2\left(x + 2\right)$
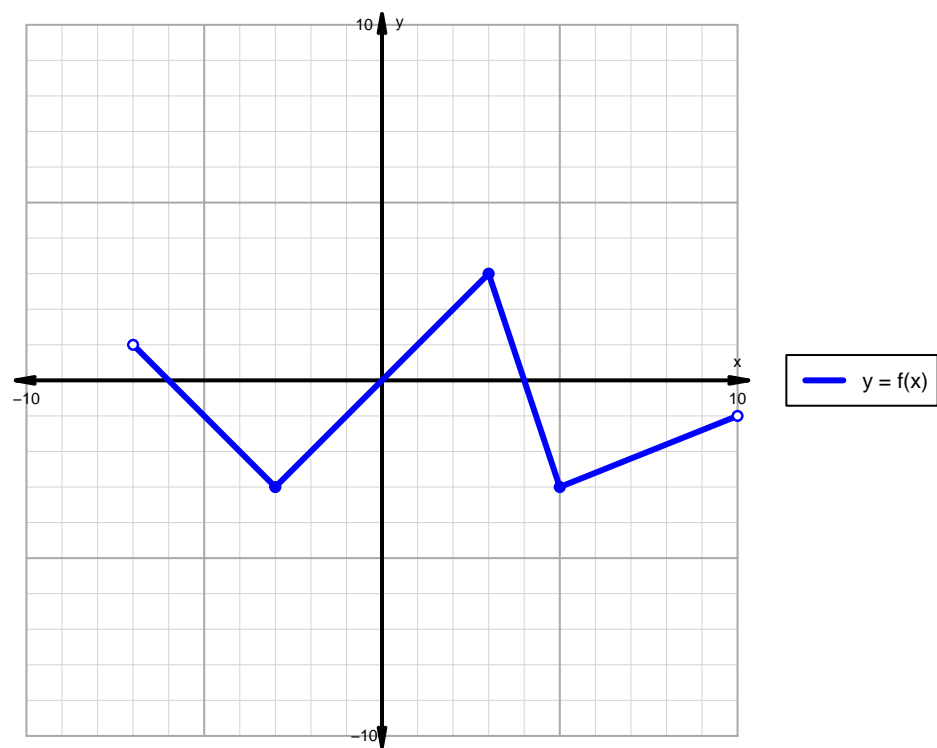
$y = \dfrac{\sqrt[3]{x}}{2}$

$y = \left(\dfrac{x}{2}\right)^2$
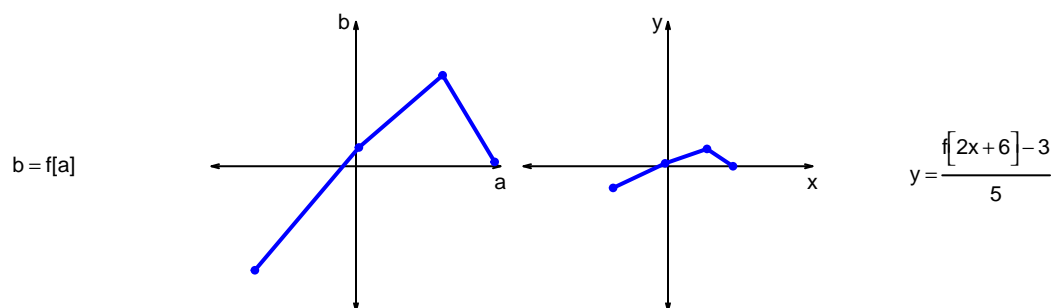
Question 3 (20 points)

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f[2x+6]-3}{5}$ are represented below in a table and on graphs.

a	b	x	y
-70	-72	-38	-15
2	13	-2	2
60	63	27	12
96	3	45	0

$b = f[a]$

$$y = \frac{f\left[2x+6\right]-3}{5}$$

a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[2x+6]-3}{5}$?

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Question 5 (10 points)

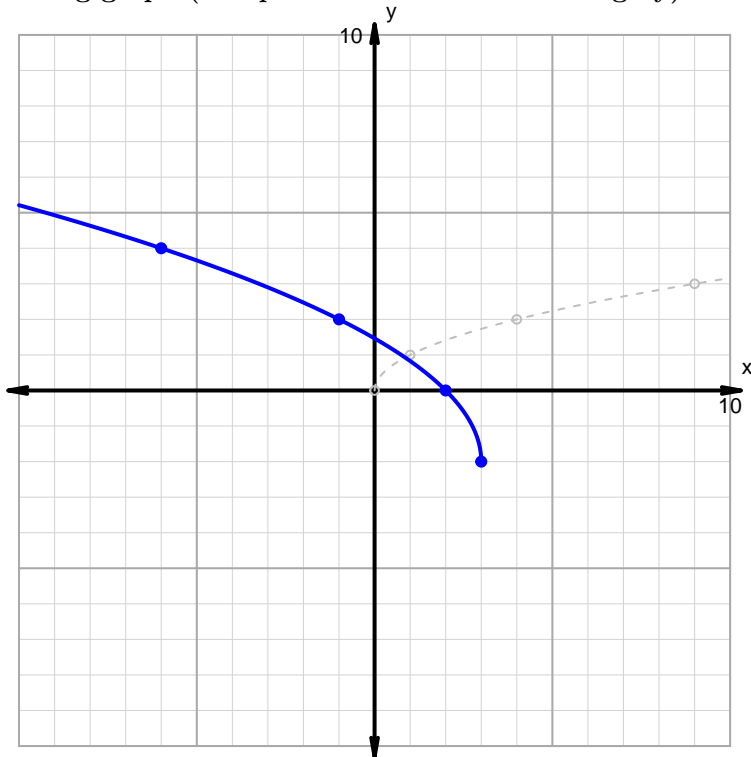A parent square-root function is transformed in the following ways:

Horizontal transformations

1. Horizontal reflection over y axis.
2. Translate right by distance 3.

Vertical transformations

1. Translate down by distance 1.
2. Vertical stretch by factor 2.

Resulting graph (and parent function in dashed grey):

- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{-1}{2} \cdot |x + 3| + 1$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	